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SUPERFUND RECORDS
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RESPONSIVENESS SUMMARY

118156
Site: Syntex Facility
ID #: MoD007452154
Break: 5.2
Other: NO

Record of Decision for
Final Management of Dioxin-Contaminated Soil and Equipment Syntex
Agribusiness, Inc.
Verona, Missouri

This Responsiveness Summary presents responses of the Environmental Protection Agency (EPA) to public comments received regarding the proposed remedial actions for dioxin-contaminated soil and equipment at the Syntex Agribusiness Site in Verona, Missouri. This document addresses all comments received by the Agency during the public comment period conducted as part of the remedy selection process. Several additional comments were received by the Agency following the close of the public comment period. All such comments received prior to publication of this responsiveness summary have also been addressed.

Comments to the EPA documents listed below in reference to the Syntex, Verona Proposed Plan, were also received during the public comment period. These documents and comments to these documents are hereby incorporated by reference into the Administrative Record.

1. September 4, 1986 on the Draft Minker/Stout/Romaine Creek Feasibility Study ("Draft M/S/RC FS").
2. March 26, 1987 on the Draft Times Beach Remedial Investigation/Feasibility Study ("Draft Times Beach RIFS").
3. September 18, 1987 on the Proposed Plan for Interim Management of Dioxin-Contaminated Sediment, Romaine Creek Portion of the Minker/Stout/Romaine Creek Site (August 1987); on the Public Comment Draft Operable Unit Feasibility Study, Romaine Creek Portion of the Minker/Stout/Romaine Creek Site (July 8, 1987); on the Proposed Plan for Interim Management of Dioxin-Contaminated Sediment, Stout Portion of the Minker/Stout/Romaine Creek Site (August, 1987); and on the Public Comment Draft Operable Unit Feasibility Study, Stout Portion of the Minker/Stout/Romaine Creek Site (July 8, 1987) ("M/S/RC OUFS").
4. March 17, 1988 on the Public Comment Draft Proposed Plan for Final Management of Dioxin-Contaminated Soil and Final Disposition of Structures and Debris at Times Beach, Missouri and the Minker/Stout/Romaine Creek Site, Missouri ("Times Beach Proposed Plan").
5. "Draft Toxicological Profile for 2,3,7,8-Tetrachlorodibenzo-p-dioxin," Agency for Toxic Substances and Disease Registry, November 1987.

INTRODUCTION

On March 21, 1988 EPA announced its Proposed Plan for the cleanup of the Syntex Agribusiness, Inc. site in Verona, Missouri. Under the Proposed Plan, soils

containing greater than 20 ppb dioxin, as confirmed by the 95 percent confidence level sampling protocol, would be excavated and treated offsite. A vegetative cover would be established and maintained over soils contaminated with between 1 ppb and 20 ppb dioxin. Remediation of the Trench Area would include installation of a vegetative clay cap and an upgradient gravel, drainage-interception trench. In addition, dioxin-contaminated equipment would be cleaned through a series of rinses.

A cleanup level of 20 ppb dioxin has been established for the Syntex, Verona site by EPA on the basis of recommendations from Federal and State health agencies. This cleanup level is appropriate for the Syntex, Verona site and is consistent with the current and future land use of the site as an industrial facility. Future land use at the Syntex, Verona site will be controlled through institutional measures including placement on the Registry of Confirmed Abandoned or Uncontrolled Hazardous Waste Disposal Sites and site access controls and restrictions. These controls will assure that the proposed cleanup of the Syntex, Verona site continues to surpass all criteria for the protection of human health and the environment.

Activities conducted under the Proposed Plan will not include remediation of the local groundwater at the plant site and in the Trench Area as the EPA at this time does not have sufficient data on which to determine groundwater remediation needs. Efforts to assess and monitor the local and area groundwaters will be initiated concurrent with the Proposed Plan. In addition sampling and analysis of Spring River fish and sediments will continue as required. If data generated from this monitoring shows contamination of the groundwater or Spring River at levels of concern remediation will be conducted.

PUBLIC PARTICIPATION

On March 21, 1988 the Agency released the Syntex "Remedial Alternatives Report" and the EPA "Proposed Plan for Final Management of Dioxin-Contaminated Soil and Equipment at Syntex, Verona." A public meeting to discuss the Syntex Report and EPA Proposed Plan was held on March 29, 1988. The public comment period on the Syntex Report and EPA Proposed Plan was concluded April 22, 1988.

This Responsiveness Summary represents a component of the Record of Decision (ROD) package, which also includes the ROD declaration, ROD summary and index to the administrative record. Formal selection of the remedy to be implemented for the Syntex, Verona site occurs by signature of the ROD declaration by the Regional Administration for EPA Region VII.

Following the ROD signature an Implementation Plan will be prepared by Syntex. This plan will include the design details for implementation and maintenance of the selected remedy. A review of the Syntex Implementation Plan will be conducted by the Agency to assure compliance with the selected remedy. Implementation of the remedy will commence upon approval of the Syntex Plan by the Agency.

The following are summaries of comments received in response to the Proposed Plan and the Agency's response to these comments.

EPA received several comments pertaining to health issues addressed in the Draft Times Beach Remedial Investigation/Feasibility Study, the Minker, Stout Romaine Creek Operable Unit Feasibility Study and the Times Beach Proposed Plan.

The supported action level established for the Syntex, Verona site is based upon the 1984 report entitled, "Health Implications of 2,3,7,8 Tetrachlorodibenzodioxin (TCDD) Contamination of Residential Soil," Renate D. Kimbrough, M.D., et.al., Center for Environmental Health, Centers for Disease Control (CEH/CDC). The EPA believes that the 1984 CDC report is a valid risk assessment upon which to base an action level. The CDC has recently supported the paper stating that no scientific evidence has been reported in the literature to date which would invalidate the assumptions upon which the 1984 risk assessment is based, or its conclusions. Additionally, responses to specific inquiries and comments to the Times Beach and M/S/RC documents will be presented in the Times Beach Responsiveness Summary. EPA will respond to these comments which in general pertain to health issues and the basis for the stated action level at the Syntex, Verona site.

EPA received comments to the Draft Toxicological Profile for 2,3,7,8-Tetrachlorodibenzo-p-dioxin.

This document is currently in draft form and has not provided a basis on which decisions were made at the Syntex, Verona site. EPA has based its decisions at the site on the 1984 risk assessment conducted by Kimbrough, et.al. The Center for Disease Control has recently reaffirmed its support of the assumptions and conclusions presented in the 1984 study. It should be noted that the Draft profile presents a compilation of information on the physical, chemical and toxicological properties which have been provided in the currently available literature. Comments to the draft profile will be forwarded to the ATSDR and will be incorporated into the Administrative Record for the Syntex, Verona site.

EPA received a comment requesting clarification on the land use restrictions needed for the proposed cleanup.

EPA has recognized the need to provide institutional controls and access restrictions at the site to assure the effectiveness of the selected remedy. These controls will include deed restrictions and maintenance of the site on the State of Missouri "Registry of Confirmed Abandoned or Uncontrolled Hazardous Waste Disposal Sites". In addition, plant site access is restricted by a perimeter fence and during periods of plant shut down a 24-hour guard is provided. Subsite access will be further restricted by perimeter fencing. Additional restrictions necessary for the protection of the soil cover will be provided in the Syntex Implementation Plan.

EPA was asked what erosion protection would be provided to assure soil stability in areas containing less than 20 ppb dioxin.

Details on the operation and maintenance of the selected remedy including maintenance of the vegetative soil covers will be provided in the Syntex Implementation Plan. The Syntex Plan will be reviewed and approved by EPA prior to implementation.

A commenter expressed concern regarding what effect the proposal to fill the Slough subsite area with clay might have on the presence of the City of Verona wastewater outfall.

The Syntex Implementation Plan will address this issue. The gravity flow wastewater outfall can be relocated to a point in the slough, downstream of the proposed filling activity, in a manner that facilitates gravity flow from the wastewater treatment plant and allows filling of the slough channel as specified in the selected remedy.

EPA was questioned regarding the risk posed by the levels of dioxin left onsite. The commenter expressed concern over the continued transport of dioxin to the Spring River.

The cleanup levels discussed in the proposed plan were established for the Syntex, Verona site based upon recommendations from state and federal health agencies. Sampling and analysis of the Spring River fish and sediments will be continued as appropriate to monitor the short and long effects associated with the site and implementation of the selected remedy. EPA feels that these monitoring efforts will provide the necessary information to assure protection of the public health and environment.

EPA received a comment indicating concern over implementation of the remedy without more knowledge on factors affecting transport of dioxin contaminated soils and on mechanisms of dioxin transport to the Spring River.

The selected remedy will serve to remove the major sources of dioxin presently onsite and stabilize areas containing dioxin below the action level. These measures in addition to the necessary maintenance will assure longevity of the selected remedy and reduce if not eliminate potential dioxin transport to the Spring River. Continuing the sampling and analysis of the Spring River fish and sediment will allow the Agency to assess the effectiveness of the remedy as to residual dioxin concentrations left onsite.

Sampling at the Syntex, Verona site and at other Missouri dioxin sites has indicated that the dioxin is tightly bound to soil particles, and that migration of the dioxin is directly related to the transport of the contaminated soils. The EPA does not believe that the dioxin contamination at the Syntex, Verona site represents a significant threat to groundwater or air quality on the basis of previous extensive sampling. Groundwater samples have to date been found to contain nondetectable values with a detection limit of 1 part per quadrillion (ppqd). Sampling of sediment and biota in the Spring River have indicated decreased concentrations over the years sampled and with distance away, downstream of the site.

EPA was asked if a deep tillage/soil inversion technique could be used as the remedy for areas containing from 1 to 20 ppb.

This alternative was considered by EPA, however it was determined not to be appropriate at the Syntex, Verona site for areas containing from 1 to 20 ppb.

A commenter suggested that all alternatives including the no action alternative, presented in the "Remedial Alternatives Report" would adequately protect the public health and the environment. The commenter further stated that flaws exist in the assumptions used to establish an action level and that recent scientific advances were not considered.

An action level of 20 ppb dioxin was established for the Syntex, Verona site based upon the 1984 report entitled, "Health Implications of 2,3,7,8 Tetrachlorodibenzodioxin (TCDD) Contamination of Residential Soil," Renate D. Kimbrough, M.D., et.al., Center for Environmental Health, Centers for Disease Control (CEH/CDC). The CEH/CDC has recently supported the 1984 paper stating that no scientific evidence has been reported in the literature to date which would invalidate the assumptions upon which the 1984 risk assessment is based, or its conclusions.

One commenter recommended that the site be left as it is for the time being since the health effects of dioxin to humans are not thought to be significant.

The no action alternative is not considered by EPA to be acceptable for the site; the potential for exposure would continue to exist. A longterm remedy that is compatible with regulatory requirements and provides protection of human health and the environment must be selected. Accordingly the no action is not considered to be a satisfactory selection.

EPA received comments which disputed the information presented in the Proposed Plan on the toxicological effects of dioxin in humans.

The literature contains a number of human health studies which draw conflicting conclusions. A number of these studies were cited by the commenter. The commenter states that "of greatest significance is the study performed on 104 residents of Times Beach" conducted by CDC, Missouri Division of Health, St. Louis University, and St. Joseph's Hospital. This article actually states:

"The results appear negative, but no overall definitive conclusion should be based solely on this initial study."

The article further states:

"Public health policy in situations such as this environmental contamination with TCDD must continue to focus on the prevention of any potential health effects (particularly delayed or long-term), even if effects are not demonstrated in a pilot study. For this reason appropriate efforts to prevent human exposure must continue, in this and other similar situations, until a more complete understanding of public health risks is obtained."

In 1986, the Centers for Disease Control provided to Congress a "Detailed Response to Subcommittee Questions on Dioxin." In their response to a question on the current extent of knowledge concerning the human health effects, CDC stated that:

"A number of epidemiology studies and health assessments in humans have given negative results. For various reasons, the results of these negative studies are not convincing, particularly because of the overriding effects of confounding variables."

CDC further states that:

"The lack of definitive human data forces the use of animal data for predicting possible human health effects."

and:

"... in the absence of useful human data to the contrary, prudent public health policy dictates an assumption that humans could suffer effects similar to those observed in animals and that preventative public health policy must be based on available animal data."

The 1984 risk assessment which supports the recommendations for cleanup levels at Syntex, Verona is based upon animal health studies. This assessment has been consistently applied during the cleanup of dioxin sites in Missouri, and remains valid for remediation of the Syntex, Verona site.

A commenter asked if there was conclusive evidence regarding dioxin's risk acceptability. EPA was asked if the toxicity of dioxin to humans, apart from chloracne, has been demonstrated.

There is disagreement in the scientific community regarding the risks due to exposure to dioxin. The position of EPA is to take a conservative approach to ensure that any error made in the assessment of risk is made of the side of safety. CDC has recently affirmed support of the 1984 health assessment that established the original action level for exposure to dioxin in a residential setting. There has been no scientific evidence presented to date that invalidates the 1984 assumption of conclusions.

The EPA received a comment concerning the Proposed Plans statement that TCDD is the most potent animal carcinogen evaluated to date by the EPA Carcinogen Assessment Group. The commenter said that this statement is misleading and inappropriate. The commenter further stated that TCDD is not a potent carcinogen if one considers its carcinogenicity relative to its acute toxicity.

The statement made in the proposed plan is technically correct. When considered on a unit risk basis, the cancer potencies of different chemicals can be compared. On the basis of a relative potency index of the 55 chemicals that CAG has evaluated, TCDD is the most potent carcinogen.

The commenter questioned the Proposed Plans statement that TCDD is 50 times as potent as BCME is irrelevant since exposure to BCME at one point was relatively common in several of the chemical industries yet exposure to TCDD is rare. In addition, the commenter stated that there still is no evidence that TCDD is a human carcinogen after 40 years of workplace experience with it.

It is suggested by the commenter that there is no evidence that TCDD is a human carcinogen after 40 years of workplace experience. The commenter also acknowledged, however, that exposure to TCDD in the workplace is rare. The potency of TCDD relative to BCME is relevant and technically correct.

A commenter questioned the use of the EPA 95 percent confidence level sampling protocol, as compared to other similar sampling procedures.

The 95 percent confidence level sampling protocol required by EPA has been extensively peer reviewed and approved by state and federal health and environmental agencies. The EPA sampling protocol has been incorporated into cleanup and sampling plans for all other Missouri dioxin sites that have successfully been remediated or which are currently undergoing remediation.

EPA was asked to clarify the proposed extent of excavation.

Subsite areas which previously were found to contain greater than the 20 ppb dioxin action level will be resampled using the 95 percent confidence level sampling protocol. Those areas found to exceed the action level will be excavated in stages or lifts using either a backhoe or other excavation equipment determined to be the most efficient and cost effective. The excavation activity will proceed until 1) levels of dioxin are below 20 ppb, 2) bedrock is reached, or 3) the four foot depth is reached. Excavation will not proceed below bedrock or the four foot depth.

A commenter strongly suggested that dioxin-contaminated soils remain in-place until a treatment technology becomes available, in the event soils cannot be treated at the Denney Farm incineration unit. In addition, the commenter contends that storage onsite subsequent to excavation creates the need for double-handling and increases the potential for human exposure.

EPA has provided that all soils, contaminated with dioxin above the 20 ppb action level, be excavated within one year after Implementation Plan approval. Excavation within the stated schedule is necessary to assure a timely completion of the remedy and to remove those sources considered to be a threat to public health and the environment. Containerization and storage of the excavated soils will be conducted in accordance to applicable EPA and state rules and regulations; in a manner that substantially reduces any threat to the public health or environment.

EPA was asked whether dioxin-contaminated soils excavated from the Syntex, Verona site would be treated at the Denney Farm incineration unit. The commenter suggested that there were a number of impediments to implementation of the proposed remedy.

EPA is currently working toward an agreement with the appropriate parties which will facilitate treatment of the excavated soils at Denney Farm. In the event these negotiations fail dioxin-contaminated soils excavated during site remediation will be stored onsite in compliance with EPA rules and regulations until an appropriate treatment technology becomes available.

EPA was asked what action would be taken subsequent to the groundwater monitoring program identified in the Proposed Plan.

The EPA at this time does not have sufficient data upon which to base future decisions regarding groundwater remediation. The groundwater monitoring program is an effort, in addition to the existing groundwater monitoring efforts, to further identify the extent of groundwater contamination. At the time sufficient data is received a determination will be made as to the appropriate response action, based on the applicable, relevant and appropriate requirements under federal and state environmental laws.

A commenter suggested that the reference to the Denney Farm incineration unit's capability to successfully destroy dioxin in soil to undetectable levels is an overstatement of the fact. Furthermore the commentor refuted claims that the destruction and removal efficiencies are high enough to allow delisting of the dioxin contaminated soil following treatment.

Analysis of residues generated at the Denney Farm incineration unit have revealed non detectable levels of dioxin, utilizing the detection limits applicable at the time of analysis. These results demonstrate that the incineration unit at Denney Farm is capable of removing residual dioxin to a level which will allow delisting of the contaminated soil from the Syntex, Verona facility.

EPA received a comment questioning the past and present process for delisting residues generated at the Denney Farm incineration unit. the commenter further stated that the current delisting procedures are invalid.

The 1985 delisting procedures were based on knowledge that was currently available at the time regarding safe levels for delisting. The current model used for delisting purposes was published in the Federal Register and is the only model currently approved by EPA for delisting activities. The delisting of this residue is rule making procedure separate and apart from this Record of Decision. Comments pertaining thereto should be addressed to the EPA Office of Solid Waste in Washington D.C.